

CLAIMS

What is claimed is:

1. An instrument for arthroscopic tunneling into a bone, comprising:
 - a drill head operable to drill into a bone;
 - a flexible drill shaft coupled to the drill head for tunneling into the bone;
 - a guide mechanism coupled to the flexible drill shaft operable to guide the flexible drill shaft in a selected non-linear cutting path; and
 - wherein the selected non-linear cutting path includes entering at a first position of the bone and exiting at a second position of the bone spaced a distance from the first position of the bone.

2. The instrument of Claim 1 further comprising a mechanism near the drill head for positioning a suture.

3. The instrument of Claim 1 wherein the guide mechanism further comprises:

a flexible rod slideably engaged with the housing, having a proximal end and a distal end, the flexible drill shaft coupled to the flexible rod at the proximal end; and

a handle slideably engaged with the distal end of the flexible rod and the housing, having a proximal end and a distal end, the flexible drill shaft at the proximal end.

4. The instrument of Claim 3 wherein the guide mechanism further includes:

a flexible member operably interconnected to the flexible drill shaft; and

wherein sliding of the handle causes tension in the flexible member to direct the flexible drill shaft along the selected non-linear path.

5. The instrument of Claim 4 further comprising a spring retained in the housing.

6. The instrument of Claim 3 wherein the guide mechanism further includes:

a flexible member connected to the flexible drill shaft; and

wherein the sliding of the handle causes tension in the flexible member to direct the flexible drill shaft along the selected non-linear path.

7. The instrument of Claim 3 wherein the guide mechanism further includes:

a flexible member coupled to the flexible drill shaft and extending through the housing; and

wherein the flexible member is manually manipulated to direct the flexible drill shaft along the selected non-linear path.

8. The instrument of Claim 3 wherein the flexible rod is made from a memory shape alloy.

9. The instrument of Claim 1 further including an arthroscope for viewing the cutting path.

10. The instrument of Claim 1 wherein the guide mechanism further comprises a flexible member and a flexible rod including shape memory alloy.

11. An assembly for arthroscopic tunneling, comprising:
 - a housing operable to selectively engage a drill motor;
 - a flexible rod slideably engaged with the housing, having a first end and a second end;
 - a flexible drill shaft including a first end coupled to the first end of the flexible rod and a second end coupled to a drill head for tunneling into a bone; and
 - a guide mechanism coupled to the flexible rod operable to guide the flexible drill shaft in a selected cutting path;
 - wherein the selected cutting path includes forming a non-linear path by entering the bone at a first location on a bone surface and exiting the bone at a second location on the bone surface.

12. The assembly of Claim 11 further comprising a mechanism near the drill head for positioning a suture.

13. The assembly of Claim 11 wherein the guide mechanism further comprises:

a handle slideably engaged with the second end of the flexible rod and the housing,

wherein the handle includes a first end operable to engage a drill member and a second end operable to engage the flexible drill shaft.

14. The assembly of Claim 13 wherein the guide mechanism further includes:

a spring disposed in the housing; and

a flexible strand coupled to the flexible drill shaft and the spring wherein the sliding of the handle causes the spring to compress and tension the flexible strand to direct the flexible drill shaft along the non-linear path.

15. The assembly of Claim 13 wherein the guide mechanism further includes:

a flexible strand coupled to the flexible drill shaft wherein the sliding of the handle causes the flexible strand to direct the flexible drill shaft along the non-linear path.

16. The assembly of Claim 13 wherein the guide mechanism further includes:

a flexible strand coupled to the flexible drill shaft and the spring wherein the sliding of the handle causes the spring to compress and tension the flexible strand to direct the flexible drill shaft along the non-linear path.

17. The assembly of Claim 13 wherein the guide mechanism further includes:

a flexible strand coupled to the flexible drill shaft and extending through the housing; and

wherein the flexible strand can be manually manipulated to direct the flexible drill shaft along the non-linear path.

18. The assembly of Claim 11 wherein the flexible rod is made from a memory shape alloy.

19. The assembly of Claim 11 wherein the flexible drill shaft is coupled to the flexible rod by at least one retaining member.

20. The assembly of Claim 19 wherein the retaining member is formed onto the flexible rod.

21. A method of forming a non-linear tunnel through a bone structure, comprising:

positioning a single shaft cutting tool adjacent to the bone structure at a first location; and

cutting a non-linear path through the bone structure so as to cause the single shaft cutting tool to exit the bone structure at a second bone location.

22. The method of Claim 21 further comprising forming the non-linear path in the bone substantially percutaneously.

23. The method of Claim 21 wherein the first location and second location are co-planar.

24. The method of Claim 21 further comprising:
pulling a suture through the non-linear path to secure a suture to soft tissue near to the first and second bone location;

25. The method of Claim 21 further comprising:
directing the single shaft cutting tool in the non-linear path with a strand.

26. The method of Claim 21 further comprising:
directing the single shaft cutting tool in the non-linear path with a rod formed of a memory-shape alloy.

27. The method of Claim 21 further comprising:
viewing the cutting of the non-linear path with an arthroscope.